SOME COLORADO SPECIES OF THE GENUS LACHNUS.

By C. P. Gillette.

Lachnus coloradensis, n. sp.

Adult Stem Mother.—General color black, with more or less rufous upon the head, thorax and legs; the anterior and nearly all of middle femora, the proximal portion of hind femora, and the basal portions of all tibiæ rusty brown, the hind tibiæ being black nearly to the base; all tibiæ black at extreme base; antennæ pale with distal ends of joints 3, 4 and 5 black. The black of the dorsum is mostly dull, but with polished lines running across between each two segments, and a larger polished area on joints 7 and 8. In some specimens there is somewhat of a rufous tinge over most of the dorsum; cornicles black, mammiform, terminating in a slightly projecting nipple; cauda scarcely apparent; vertex prominent and convex. Length of body 4.25; antenna 1.90. Joints of antenna: III, .50; IV, .26; V, .30; VI, .23; hind tibiæ, 3.10; beak attaining hind margin of third abdominal segment; sternum and first two abdominal segments rusty brown; head small, convex in front; one sensorium near distal ends of joints 3, 4 and 5, besides the permanent one on joint 5, and sometimes there are two on joint 4. (See Plate X, figures 1-3).

The young of the second generation are pale gray with dusky green upon dorsum of head and in the region of the cornicles, the thoracic segments being nearly white, and the abdomen dusky to brownish. (See figure 4.)

Apterous Viviparous Female.—General color black or blackish, somewhat shining, especially below; head, thorax, coxæ and basal portions of femora and tibiæ more or less rufous; antennæ pale with distal ends of joints black; terminal joint all black; shape of abdomen varying from broad oval to rather elongate. Length of antenna 2; joints proportioned as follows: 7 : 6 : 43 : 22 : 25 : 14; sensoria as in stem mother, except that there are usually two sensoria on joint 4; rostrum nearly attaining tip of abdomen; cornicles mammiform, small, about .40 across mammiform base; hind tibiæ very long and curved.

This form resembles the fundatrix so closely it was not thought necessary to draw it. Antenna shown in figure 5.

Winged Female of Second Generation.—Color rusty yellow to yellowish brown; cornicles, genital plates, mesosternum, coxæ, distal half of beak, joint 6 and distal ends of joints 3, 4 and 5 of antennæ, all of the tarsi, distal ends and very short proximal ends of all tibiæ (fully four-fifths of hind tibiæ), distal ends of all the femora, eyes and stigmas, black or blackish. The distal ends of middle and front femora may be only dusky; beak attaining 8th abdominal segment; dorsal surface slightly pulverulent; upon the pronotum there is a diagonal lateral line upon either side; there is a V-shaped white mark near the middle of the anterior margin and one near the posterior margin of the mesothorax and a white line near insertion of either front wing. The scutellum is more or less powdered, as is the metathorax, and transverse white dashes and lateral spots upon 3rd and 4th abdominal segments. See Plate X, figures 6 to 10.

Apterous Oviparous Female.—Prevailing color cinnamon brown to brownish black, shining, with head and pro- and meso-thorax a sordid pale yellowish green to light brown; beneath, pale greenish yellow, darker posteriorly and at lateral margins of abdomen; a heavy covering of white secretion upon the tergum and pleuræ of the abdomen back of the cornicles to the terminal segment, which is exposed; cornicles black, moderate in size of basal enlargement; antennæ with tips of joints 3, 4 and 5 and all of 6 black; beak nearly attaining the tip of the abdomen; form rather elongate; legs colored as in apterous viviparous female; hind tibiæ, with many small sensoria; hind legs very short; tibiæ but little swollen; length of body 3; antenna, 1.50; joints: III, .51; IV, .28; V, .29; VI, .20; hind tibiæ, 2.50. See figures 11-13.

Eggs.—They are deposited in single rows on the upper surface of the needles and are covered with a rather coarse, waxy material from the abdomen of the oviparous female. As soon as an egg is deposited, the female rubs her hind tarsi in the waxy secretion on her abdomen and then rubs them over the egg and continues this process till the latter is well covered with the short, broken bits of wax as shown in figure 14.

Alate Male.—Described from alcoholic material taken by Mr. L. C. Bragg from Engelmann spruce at Fort Collins, Colorado, November 9, 1906, along with the oviparous ♀ ♀.

Black parts, proportions of antennal segments, and cornicles as in alate viviparous ♀; length of body about 2.70; wing, 3.90; antenna, 1.45; hind tibia, 2.12; sensoria of antennæ numerous on joints 3 to 6, circular in form and varying much in size. The numbers upon the segments run about as follows: III, 18; IV, 14; V, 18; VI, aside from the rather scattered cluster of small sensoria about the permanent one, there is 1 or 2 on the basal half. See figure 15.

This is a common species upon Engelmann and blue spruces in Northern Colorado, which we have been taking for the past eight years. It is a bark feeder and has always been found by us attacking small limbs where the lice insert their beaks in the crevices of the bark. As in other species treated in this paper, the color markings of the young lice are very distinctive.

Our accessions records for this species are as follows:

Fundatrix	Ft. Collins,	Colo.,	April 20, '08,	C. P. Gillette,	*Picea parryana*
	"	"	April 20, '08,	L. C. Bragg,	" "
	"	"	April 21, '08,	C. P. Gillette,	" "
Alate and apterous viviparous females	"	"	..... '00,	C. P. Gillette,	" "
	"	"	May 4, '08,	C. P. Gillette,	" "
	"	"	May 12, '08,	C. P. Gillette	" "
	"	"	May 23, '08,	Miriam A. Palmer	" "
	"	"	May 25, '08,	C. P. Gillette,	" "
	"	"	June 6, '11,	L. C. Bragg,	" "
	Ward,	"	July 17, '09,	L. C. Bragg	" "
	Tolland,	"	July 25, '13,	Ellsworth Bethel,	englemanni
Oviparous Female	Ft. Collins,	"	Sept. 1, '06,	L. C. Bragg,	"
	"	"	Oct. 6, '09,	O. G. Babcock,	"
	"	"	Nov. 10, '14,	L. C. Bragg	"
	"	"	Nov. 14, '10,	L. C. Bragg,	"
	"	"	Nov. 9, '06,	L. C. Bragg,	"
♂	"	"	Nov. 9, '06,	L. C. Bragg,	*Picea parryana*

***Lachnus palmeræ,** n. sp.

Stem Mother, First Instar.—General color ashy gray, due to a fine white powder which covers the body; eyes, tips of antennæ and beak, and the cornicles, black or blackish; a dusky to blackish transverse band, usually interrupted for some distance in the middle, upon the first abdominal segments; upon either side of the prothorax, an oblique, impressed dark line; and extending over the abdomen about six rows of small impressed dark spots. A very narrow median dorsal dark line is usually quite distinct and is due to the absence of the white powder. Antennæ, legs and body rather hairy; antennæ with four joints, the third being more than half of the antenna in length; fourth joint terminated by a short conical spur. As the lice grow in this instar the white powder increases in amount. At base of the spur is a single prominent sensorium. Length about 1.35.

The young lice, upon hatching, cluster on the bark of the twigs to insert their beaks and feed. See figure 16.

Described from specimens taken on a small Engelmann spruce on the college campus, March 17, 1910.

Adult Stem Mother.—The general color is a dark sordid brown, in some examples almost black; all of the lice conspicuously marked with gray or whitish lines and spots; a black transverse band, which is broken at the middle, extends across the first segment of the abdomen to the lateral margins; in front of this are black or dusky splashes upon the segments of the thorax, making two broken black bands extending to the head; the first and last joints of the antennæ, the distal ends of joints 4 and 5, the eyes, all of the tarsi, the coxæ, the knees, the distal ends of the tibiæ and their extreme bases, the cornicles and beak and the genital plates, black or blackish. From the head to the tip of the abdomen upon the dorsum is a narrow gray line on either side of which are broken transverse gray lines about one to each segment, and all about the same width as the median line, and in most instances, in two pieces, on either side of the median line. The head is light rusty brown, more or less covered with white powder; the antenna and the greater portion of the femora and tibiæ, are pale yellowish or sordid white in color. The cornicles are large, broad at the base, moderately elevated and mammiform in shape, and the beak reaches to the hind margin of the third segment of the abdomen; legs, antennæ and entire body, rather thickly set with slender hairs; head small, quite convex in front and usually distinctly bi-lobed; cauda not apparent. Length of body, 3.75 to 4 (balsam spec. 3 to 3.50) by 2.40 wide; length of antenna 1.30; joints: III, .45; IV, .20; V, .23; VI, (with spur) .17, with little variation. See figures 16a to 19.

Apterous Viviparous Female.—In general appearance and markings like the stem mother. No figures.

---

*I take pleasure in dedicating this species to Miss Miriam A. Palmer, not merely because she made the drawings for this and other aphid papers, but because she takes a keen and intelligent interest in everything scientific, and especially in the Aphides, and our friends, their enemies, the *Coccinellidæ*.

Young.—About one-third grown. Taken by the writer April 25, 1908. The meso- and meta-thorax are quite light and somewhat pinkish or flesh colored; the abdomen is dusky brown, but spotted with white pulverulence much after the pattern of the adult, and especially is this true of specimens about half grown; the head and abdomen are conspicuously darker than the thorax, usually almost black, with four conspicuous white blotches, two lateral, about midway of the abdomen, and two on the median line, one at the meta-thorax and the other at the extreme tip. The posterior half of the prothorax is also black except upon the middle portion. See figure 20. The beak of very young lice is nearly twice the length of the body. See figure 16.

Winged Female of Second Generation.—Described from specimens bred in the laboratory on sprigs of blue spruce, May 11, 1908.

General color of body, blackish; a rather conspicuous median white stripe begins on the vertex of the head and extends to the middle of the mesothorax. A continuation of this stripe appears as a white dash upon the middle of the scutellum and as white spots upon the median dorsal line of the abdomen. Upon either side of this row of dots upon the abdomen is another similar row, making three rows of white spots or dashes extending to the region of the cornicles. Back of the cornicles there is also more or less of a white powdery secretion appearing either as spots or transverse lines. On the scutellum the white may extend laterally so as to almost entirely cover this part. There is also some of this white powder along the lateral margins of the thorax beneath the wings, and upon the sides of the abdomen in front of the cornicles, and also behind and beneath these organs. The whole ventral surface is more or less spotted with white. Joints 1, 2 and 6 and the distal ends of joints 3, 4 and 5 of the antennæ, are black; all of the tarsi, the distal ends of all the femora and tibiæ, and the coxæ are black; the remaining parts of the legs and the antennæ are very pale yellow. The cornicles are very large and black; genital plates and eyes black; beak whitish to the middle, the distal one-half being black or blackish, and reaching to the eighth abdominal segment; wings of medium length, stigma long, black, narrow and parallel sided; stigmal vein straight; the whole surface of the body, including legs and antennæ, thickly set with fine hair; eyes very prominent; ocular tubercles very small; hind tibiæ black for fully one-half their length, and all of the tibiæ having a short black portion at the proximal end; beak surpassing cornicles. Sensoria rather indistinct and variable in number and distributed about as follows: On distal one-half of third joint, 3 to 5; fourth joint, 1 to 3; fifth joint, 2 to 3; cornicles about .30 high by .40 broad at base, mammiform. Length of antennæ about 1.30; joints I and II of antennæ together .24; III, .54; IV, .26; V, .27; VI, .18; length of body, 3.50; wing, 4.50; hind tibiæ, 2.50. The general color when placed in alcohol is a light yellowish brown. The third transverse vein with its branches is much more slender than the first and second stigmal veins. See figures 21-23.

Figure 22, Plate I, was drawn from an antenna plainly showing seven sensoria on Joint III, but 3 to 5 were all that could be seen in other examples.

Oviparous Female.—Differs from the stem ♀ in general appearance in being more slender in form, having the white markings much heavier, and especially in having the head and all the abdomen back of the cornicles, except the anal plate, white. The hind tibiæ are thickly set with sensoria throughout their length. Length of body 4; antenna, 1.15; ratio of joints beyond the second—30 : 14 : 16 : 13 (with spur). See figures 24 to 27.

The eggs are yellowish brown when laid and measure 1.30 millimeters in length. They soon turn black in the daylight and are deposited mostly on the bark of the twigs at the bases of the needles, but sometimes are placed upon the needles also. See figures 24 to 28.

Alate Male.—The males resembles the alate viviparous ♀, but are much smaller, about 2.30 long, and more slender; the white markings are lighter and the black markings upon the antennal segments are absent, or nearly so. Joints 3, 4 and 5 of the antenna have many tuberculate sensoria irregularly distributed throughout their lengths; about 50 may be counted on joint III, about 15 on IV, and about 6 on V. Ratio of joints beyond second about as follows: 20 : 10 : 12 : 7 (with spur).

Described from examples taken on blue spruce, Ft. Collins, Colo., October 14, 1910, by L. C. Bragg, and from *Picea Engelmanni*, Fort Collins, 10-6, '09, by O. G. Babcock. See figures 29 and 30.

This is a very common species on the blue spruce in the vicinity of Fort Collins, Colorado, and is altogether a bark feeder attacking the small limbs.

Our Collection records are as follows:

Young Fundatrix	Ft. Collins,	Colo.,	Mar. 16, '10,	M. A. Palmer,	*Picea engelmanni*
	"	"	April 21, '08,	C. P. Gillette,	" *parryana*
Adult Fundatrix	"	"	April 20, '08,	L. C. Bragg,	" "
	"	"	April 21, '08,	C. P. Gillette,	" "
	"	"	April 24, '08,	M. A. Palmer,	" "
	"	"	April 25, '08,	C. P. Gillette,	" "
Apterous and Alate Viviparous Females	"	"	May 4, '08,	C. P. Gillette,	" "
	"	"	May 5, '08,	C. P. Gillette,	" "
	"	"	May 11, '08,	C. P. Gillette,	" "
	"	"	May 12, '08,	C. P. Gillette,	" "
	"	"	May 12, '10,	L. C. Bragg,	" "
	"	"	May 16, '10,	L. C. Bragg,	" "
	"	"	May 18, '12,	L. C. Bragg,	" "
	"	"	May 20, '12,	L. C. Bragg,	" "
	"	"	June 2, '06,	L. C. Bragg,	" "
Oviparous Female	"	"	Oct. 6, '09,	O. G. Babcock,	" *englemanni*
	"	"	Nov. 11, '11,	L. C. Bragg,	" *parryana*
Male.....	"	"	Oct. 14, '10,	L. C. Bragg,	" "
	"	"	Oct. 17, '10,	L. C. Bragg,	" "
	"	"	Oct. 21, '09,	L. C. Bragg,	" *engelmanni*
	"	"	Oct. 22, '09,	L. C. Bragg,	" "

Lachnus braggii, n. sp.

Taken feeding upon the bark of the twigs of Colorado blue spruce, *Picea parryana*, only.

Stem Mother.—Almost completely covered with a white pulverluence, but over the dorsum there are many spots and transverse broken bands where the white powder is not present and where the dusky brown to black color of the body can be seen. The cornicles are dark brown or blackish in color, quite small, and not very much elevated above the surface. The legs except the tips of the tibiæ and the tarsi; and the antennæ, except the extreme tips, are light amber in color. The eyes and genital plates are black, and the ventral surface of the body is covered with a light gray pulverulence. Joint 6 and distal end of 5 of the antenna, black or blackish; length of body from 3.20 to 3.70; width 2.40 to 2.50; length of antennal joints: III, .40; IV, .17; V, .21; VI, .17; whole length, 1.10; joints 4, 5 and 6 usually with one sensorium each besides the permanent ones on 5 and 6. When placed in balsam, there is a broken line of black extending from the prothorax to the first segment of the abdomen on either side of the median line. The two lines are made by a pair of black blotches upon the dorsum of each thoracic segment; a row of small black dots lies outside of these near each margin. The body is covered with a very fine, but rather long, pubescence which occurs also upon the joints of the antennæ and upon the legs. The length of the hind tibiæ is 1.60 to 1.70; beak short, but little surpassing the hind coxæ. See Plate XI, figures 1 to 4.

Apterous Viviparous Female, Second Generation.—Body covered with white pulverulence as in case of the stem mother; color also the same throughout. Length of body 3.75; width 2.40; antennal joints: III, .46; IV, .18; V, .23; VI, .17; length of antenna, 1.17; cauda appearing as a short broad lobe, convex on the posterior margin, and slightly upturned; beak just surpassing the 2d coxæ; head very small, quite convex on the frontal margin, not bi-lobed; sensoria of antenna rather indistinct and about as follows: III, 0; IV, .1 or .2; V, .2; VI, with terminal cluster. See figure 5.

Young of Third Generation, before first moult, pale amber in color, with a light covering of white pulverulence, and the head rather conspicuously dark dusky brown. Down the dorsum is a double row of small naked spots that appear a little darker than the general surface. The cornicles appear as little black dots and the genital plates and tarsi are dusky brown. See figure 6.

Winged Female, Third Generation.—Reared in the laboratory from the same colony from which the stem mother was described.

The ground color is pale to dark yellowish brown, or, in light examples, a sordid white. Head and thorax above, blackish or dark chocolate brown, rather heavily powdered with white; eyes and cornicles black, as are also the tarsi, and distal ends of all the tibiæ, the genital plates, the stigma of the wings, the last joint of the antennæ and very short distal rings upon joints 3, 4 and 5. The abdomen may be almost entirely white, due to the white powder which covers the body, or there may be very distinct white transverse bands separated by a somewhat

darker portion which exposes the yellowish color of the abdomen beneath. On the under surface, the color is pale yellowish, more or less heavily powdered everywhere with white. The distal ends of the femora are dusky brown, or, in some specimens, almost black, especially the hind pair. The cornicles are very small as in the apterous stem mother; hind tibiæ short, stigma of wing long and narrow and almost parallel sided; length of body, 2.75; length of wing, 3.70; cauda short and very broad and oval on the posterior margin, which is black; antenna, 1.14; hind tibia, 1.60; beak, 1.54; cornicles mammiform, smaller than in *palmeræ*, about .11 high by .14 broad at the base; joints of antennæ about as follows: III, .44; IV, .19; V, .23; VI, .17; sensoria of the antennæ about as follows: III, 1; IV, 1; V, 2; VI, usually 1 or 2 small ones a little below the large terminal one; entire surface of the body, including antennæ, thickly set with long delicate hairs. See figures 7 to 10.

In alcohol, the general color is pale yellow and the dorsum of the abdomen is sprinkled with black specks and dashes.

Oviparous Female.—General body color pale yellow, covered everywhere with white powder; form rather robust; thorax and segments 3 and 4 of the abdomen with broken transverse bands or dashes, and a rather distinct transverse blackish band upon the fifth segment of the abdomen between the cornicles; upon the other segments black patches only are to be found. The cornicles are black, as are the eyes, distal 2 or 3 joints of the antennæ, the tarsi, the extreme tip of the abdomen above, the hind tibiæ and the distal ends of all the femora and the middle and anterior tibiæ and coxæ; cornicles rather small. When the white powder is removed, the head and two anterior segments of the thorax are dark brown in color; length of body, 3.45; width, 2; length of antenna, 1.57; joints of antenna: III, .37; IV, .17; V, .20; VI, including unguis, .17; sensoria as follows: III, none or 1 near distal end; IV, 1 or 2; V, 1 or 2; hind tibiæ with numerous sensoria distributed throughout their length. See figures 11 to 13.

Egg.—1.25 long and .55 in diameter. See figure 14.

Alate Male.—General body color black or blackish; the body more or less covered with white pulverulence, and, on the ventral surface, green when the powder is removed; eyes, antennæ, cornicles, tarsi, distal ends of tibiæ and the greater portion of the femora black; beak reaching the tip of the abdomen; wings with costal margin and stigma blackish, the latter being rather long and broad; stigmal vein heavier than the cross veins of the wings; first and second transverse nerves moderately strong; the cubital vein with its forks very slender and scarcely visible in places; length of body, 2.20; antenna, 1.34; hind tibia, 1.46; wing, 4; antennal joints 3, 4 and 5 with many tuberculate sensoria; III about 30; IV, about 14; V, about 8. The hairs upon the legs and antennæ are rather long, thickly set and very slender. See figures 15 and 16.

This species was first discovered by Mr. Bragg upon Colorado blue spruce in Fort Collins. We have not been able to find it upon other trees. Its rather close ally seems to be *L. palmeræ*, but that species is very common and in no instance

have we found it heavily covered with the white secretion. It appears like a rusty brown or black louse on the twigs, while this one appears like a very light gray or white louse.

Our collection records are as follows:

Fundatrix	Ft. Collins,	Colo.,	April 13, '08, L. C. Bragg,	*Picea*	*parryana*
	"	"	April 21, '08, C. P. Gillette,	"	"
	"	"	April 28, '08, L. C. Bragg,	"	"
Alate and apterous viviparous females	"	"	April 22, '08, C. P. Gillette,	"	"
	"	"	April 25, '08, C. P. Gillette,	"	"
	"	"	May 14, '08, C. P. Gillette,	"	"
	"	"	May 19, '10, L. C. Bragg,	"	"
	"	"	May 21, '15, L. C. Bragg,	"	"
	"	"	June 12, '14, L. C. Bragg,	"	"
Ovip. ♀	"	"	Oct. 15, '10, L. C. Bragg,	"	"
	Boulder,	"	Oct. 23, '09, L. C. Bragg,	"	"
Male	Ft. Collins,	"	Oct. 15, '10, L. C. Bragg,	"	"

Lachnus tomentosus (De Geer).

Examples of what seems to be this species were taken by the writer from needles of *Pinus radiata*, standing on the campus of the University of California, August 8, 1915, where they were very abundant. The examples taken agree in nearly every respect with the excellent description and figures of this species given by G. Del Guercio in "Contribuzione Alla Conoscenza dei Lacnidi Italiani," 1909, p. 283.

Examples taken on *Pinus scopulorum* in Colorado and listed below, agree so closely with the European form I refrain from giving it even a varietal name.

I give below descriptions and figures made from freshly collected Colorado material. The sexual forms of this louse were found by the writer in very great abundance upon the trees of *Pinus scopulorum* in the City Park of Denver, during the month of October, 1916.

Young Stem Mother.—Specimen taken at Horsetooth Mountain, west of Fort Collins, as early as March 13, 1910. The lice were still hatching and had the habit of arranging themselves in single file, so close that they touched each other, along the needles. When first hatched, the color is dark olive-green with pale yellow legs and antennæ. After a few hours a slight grayish bloom covers the body, the legs and antennæ become considerably darker in color and the cornicles are each in a small dusky circular spot. One or two rows of small dark spots a little inside the lateral margin on either side, extend longitudinally over the abdomen. Beak not attaining tip of abdomen; length of body, 1 millimeter. See figure 17.

Adult Stem Mother.—Entirely cinereous in general color on account of a heavy flocculent secretion covering the body, legs and antennæ. The eyes, ends of the antennæ, cornicles and naked tarsi are deep black; body color, beneath the secretion, dark olive-green, legs dusky with tibiæ black tipped. Length of body 2.10; antennæ, 1; hind tibiæ, 1.30; beak but little surpassing hind coxæ; joints of antennæ: III, longest; IV and V, sub-equal; VI, with very short spur, a little shorter than V; permanent sensoria on joints V and VI only; body antennæ and legs rather sparsely set with long slender hairs. See figures 18 to 20.

Alate Viviparous Female.—Slender and powdery in appearance; length 2; antenna, 1.12; joints of antenna, III, .45; IV, .20; V, .18; VI (with spur), .15; sensoria on joint III usually very faint or appearing to be entirely absent, but as many as 3 weak sensoria found in some examples; hind tibia 1.40; beak barely reaching third coxæ. See figures 21 and 21b.

Apterous Oviparous Female.—Described from specimens taken upon the leaves of *Pinus scopulorum*, Boulder, Colorado, October 23, 1909.

The general color varies from a yellowish brown to a brownish black; the head and terminal joints of the abdomen and the small cornicles black, or blackish; the ventral surface of the abdomen and also the last two segments above, as well as below, covered with pulverulent secretion; antennæ dusky in proximal portion and becoming black towards the distal ends; eyes black; legs black except the basal portion of the middle tibiæ, and in some specimens the anterior tibiæ also; coxæ black; beak reaching the middle pair of coxæ; cornicles quite small, hardly broader than high; length of body, 2.71; length of antennæ, 1.14; joints of antennæ: III, .46; IV, .20; V, .25; VI, .17. The joints are rather slender and set with long slender hairs. Hind tibiæ, 1.75 and considerably swollen in the basal half, where there are numerous circular sensoria. Genital plates black, permanent sensoria only upon joints 5 and 6 of the antennæ. See figures 25 to 28.

Taken depositing eggs in longitudinal rows upon the pine needles. The eggs are covered with the cottony secretion from the bodies of the lice which is rubbed on by means of their hind feet. Figures 23 to 30.

Winged Male.—Body almost black in color, but rather heavily covered with pulverulent secretion, both above and below. The antennæ, legs, costal margin of wings, stigma, stigmatic vein and eyes black. The first and second cross veins are also rather conspicuously black. Second fork of cubital vein, at least in some wings, entirely wanting. Length of body, 2; antenna, 1.57; wing, 3.43; hind tibiæ, 1.60; beak surpassing the hind coxæ; joints of antennæ: III, .60; IV, .29; V, .31; VI, .2. Numerous tuberculate sensoria occur upon joints 3, 4 and 5; upon III, about 28; IV, 14; V, 6; second fork of cubital vein absent on all the wings of the five specimens examined.

The tarsi are very long in this species, the hind tarsus being nearly as long as joint 3 of the antenna. See figure 31.

This species seems very close to *L. pini-radiatae* Davidson.

Collection data as follows:

Fundatrix	Ft. Collins, Colo.,	April 7, '10,	M. A. Palmer,	*Pinus scopulorum*	
	" "	May 28, '08,	L. C. Bragg,	"	"
Alate and apterous viviparous females	Colo. Spr., "	June 22, '99,	L. C. Bragg,	"	"
	Ft. Collins, "	June 30, '15,	C. P. Gillette,	"	"
	Livermore, "	July 18, '16,	M. A. Palmer,	"	"
Oviparous ♀	Ouray, "	Sept. 27, '14,	C. P. Gillette,	"	"
	Ft. Collins, "	Oct. 13, '10,	L. C. Bragg,	"	"
	Boulder, "	Oct. 23, '09,	L. C. Bragg,	"	"
	Ft. Collins, "	Nov. 7, '09,	M. A. Palmer,	"	"
	" "	Nov. 25, '09,	M. A. Palmer,	"	"
Male	Ouray, "	Sept. 27, '14,	C. P. Gillette,	"	"
	Ft. Collins, "	Oct. 13, '10,	L. C. Bragg,	"	"
	Boulder, "	Oct. 23, '10,	L. C. Bragg,	"	"
	Ft. Collins, "	Nov. 7, '09,	M. A. Palmer,	"	"

***Lachnus ponderosæ** Williams.

Stem Mother.—Described from two specimens taken among many second generation individuals on the bark of the smaller twigs of *Pinus ponderosa*. Specimens taken by Miss Miriam A. Palmer in the foothills west of Ft. Collins.

Ground color of adults golden brown, cornicles black with very large mammiform bases of the same color; powdery above and below; the markings not well defined as the specimens have been rubbed; distal ends of femora and proximal and distal ends of tibiæ black; hind tibiæ with only a small portion near the proximal end pale; beak attaining the tip of the abdomen; anal plates black; length of body 3; width 1.90; hind tibiæ 2. A rather robust species. No figures.

Apterous Female, Second Generation.—Taken April 30, 1910, along with the winged examples described below.

Ground color dark, golden brown; cornicles, tips of antennæ, distal ends of femora and tibiæ, tarsi, transverse patches on joints 1, 2, 7, 8 and 9 of the abdomen; joints 1, 2 and 6 and distal ends of joints 3, 4 and 5 of the antennæ black; lateral margins of the thorax, an irregular median patch on the first three joints of the abdomen and on either lateral one-third of joint 4 of the abdomen powdery white; also small white spots posterior to the cornicles on lateral margins of joints 6, 7 and 8. Length, 2.75; width, 1.50 to 1.75; antenna, 1.17; hind tibiæ, 2; joints of antenna in about the following ratios: 13 : 12 : 61 : 23 : 29 : 21 (with spur). The sensoria are not always easily seen, but in most examples they can be determined as follows: III, 1; IV, 1; V, 2; VI, with terminal or permanent sensoria only. It is not unusual to find two sensoria on joints III and IV and occasionally 3 or 4 may be found on joint III. See figures 32 to 35.

Alate Viviparous Female.—General color of the abdomen the same golden brown as in the stem female; head, thorax, cornicles and anal plate black; antennæ blackish; the basal portions of joints 3, 4 and 5 of the antennæ pale; stigma long, narrow, parallel sided, black and extending nearly one-half the distance from its distal extremity to base of wing; tibiæ with a pale ring near the proximal end; length of body 2.50; wing 4; hind tibiæ, 2.25; joint 3 of antenna as long as 4 and 5 together; 5 distinctly longer than 4; 6 with spur, not quite as long as 4; joint 3 with 4 to 6 large sensoria; joints 4 and 5 with two sensoria each.

Described from many specimens taken at different dates upon the twigs of yellow pine, *P. ponderosa*.

Supplementary description from a dozen fresh specimens just taken from pine twigs brought to the laboratory today, April 13, 1910.

Middle legs entirely black, except for a narrow light ring near the proximal ends of the tibiæ; hind tibiæ entirely black in some examples, others show the pale annulus; entire under surface powdered with white secretion; diagonal white lines more or less distinct upon the mesothorax, and there are four prominent transverse white bands, widest at the middle, upon the dorsum of the abdomen in front of the cornicles;

---

*Aphididæ of Nebraska, 1910, p. 22.

a spot between the cornicles, and a large transverse band back of the cornicles; sensoria of third joint of antenna four to six in number, and two each upon segments 4 and 5; beak extending nearly to the tip of the abdomen or surpassing it; tibiæ between 1.80 and 2.10. See figures 37 to 42.

Alate Male.—Described from a single specimen in balsam. Length of body, 1.40; antenna, 1; joints of antenna proportioned as follows: III, 26; IV, 15; V, 16; VI (with spur), 13; sensoria rather strongly tuberculate nearly circular and varying greatly in size occurring on all sides of the segments, very numerous on joint III; joint IV with 10 to 12; V, with 5 to 6; VI with 1 besides the terminal group; eyes very prominent; beak long, extending somewhat beyond the tip of the abdomen; hind tibia, 1.25; wing, 3.3;. See figure 40, Plate II.

Taken by Miss M. A. Palmer on *Pinus scopulorum*, Nov. 25, 1909, in the foothills, near Fort Collins.

For the original descriptions, see "The Aphididæ of Nebraska," Williams, in University Studies, Vol. X, No. 2, 1910.

Lachnus pini (Linn), as described by Kaltenbach and Koch, is very close to this species.

We have taken examples of this species, all from *Pinus ponderosa* as follows:

Young Stem Mothers.....	Ft. Collins,	Colo.,	Mar. 3, '10, C. N. Ainsley
Adult Stem Mothers.....	"	"	Mar. 19, '10, M. A. Palmer
Apterous and Alate Viviparous Females....	Boulder,	"	Aug. 7, '98, C. P. Gillette
	Ft. Collins,	"	April 8, '16, L. C. Bragg
	"	"	April 11, '10, M. A. Palmer
	" ft. hills	"	April 13, '09, M. A. Palmer
	"	"	April 23, '11, M. A. Palmer
	"	"	May 13, '10, M. A. Palmer
	Boulder,	"	May 31, '11, L. C. Bragg
	"	"	June 1, '11, L. C. Bragg
	"	"	June 1, '12, L. C. Bragg
	Ft. Collins,	"	June 4, '13, L. C. Bragg
	"	"	June 11, '16, L. C. Bragg
	Walsenburg,	"	June 15, '07, C. P. Gillette
	Boulder,	"	June 18, '09, L. C. Bragg
	Colo. Spr.,	"	June 20, '11, L. C. Bragg
	Boulder,	"	June 24, '13, L. C. Bragg
	Ft. Collins,	"	June 25, '11, M. A. Palmer
	Eldora,	"	June 25, '11, L. C. Bragg
	Boulder,	"	June 28, '06, L. C. Bragg
	Ft. Collins,	"	June 28, '16, L. C. Bragg
	Trinidad,	"	June 30, '10, B. G. D. Bishopp
	La Plata,	"	July 7, '98, C. P. Gillette
	Ft. Collins,	"	July 14, '16, M. A. Palmer
	Livermore,	"	July 18, '16, M. A. Palmer
	Ft. Collins,	"	Aug. 15, '16, M. A. Palmer
Oviparous Females and Males.....	Ft. Collins,	Colo.,	Nov. 23, '10, M. A. Palmer
	"	"	Nov. 25, '09, M. A. Palmer

EXPLANATION OF PLATES.

Plate X.

Lachnus coloradensis, n. sp. 1, adult fundatrix, × 7; 1a, cauda of fundatrix, × 40; 1b, cauda of fundatrix (side view); 1c, gonopophyses of apterous viviparous, × 70; 2, antenna of fundatrix, × 40; 3, cornicle of fundatrix; 4, young, second generation, one-third grown, × 7; 5 antenna of apterous viviparous, × 40; 6 alate viviparous, second generation, × 7; 7 cornicle of alate viviparous, × 40; 8, terminal three joints of the beak, × 40 (alate); 9, tarsal joints of alate viviparous, × 40; 10, antenna of alate viviparous, × 40; 11, oviparous female, × 7; 12, antenna of oviparous female, × 40; 13, tibia of oviparous female, × 23; 14, eggs laid on spruce needles, × 5; 15, antenna of male, × 40.

Lachnus palmeræ, n. sp. 16, fundatrix, first instar, × 13; 16a, fundatrix, × 7; 17, gonopophyses of fundatrix, × 40; 18, cornicle of fundatrix, × 27; 19, antenna of fundatrix, × 40; 20, young of second generation, one-half grown, × 7; 21, alate viviparous, second generation, × 7; 21a, cauda of alate viviparous, × 33; 21b, cauda of alate viviparous, side view; 22, antenna of alate viviparous, × 40; 23, terminal three joints of beak of alate viviparous, × 40; 24, oviparous female, × 7; 25, antenna of oviparous, × 40; 26, hind tibia of oviparous, × 23; 27, twig of *Picea engelmanni* with eggs and oviparous female, × 3; 28, egg, × 7; 29, male, × 7; 30, antenna of male, × 40. Original; Miriam A. Palmer, Delineator.

Plate XI.

Lachnus braggii, n. sp. 1, fundatrix, × 7; 2, cornicle of fundatrix, × 40; 3, terminal three joints of beak of apterous viviparous, × 40; 4, antenna of fundatrix, × 40; 5, antenna of apterous viviparous, × 40; 6 young of third generation, one-third grown, × 10; 7 alate viviparous, third generation, × 7; 8, antenna of alate viviparous, third generation, × 40; 9, cauda of apterous viviparous, × 40; 9a, cauda of apterous viviparous, side view, × 33; 9b, gonopophyses of apterous viviparous, × 40; 10, tarsal joints of alate viviparous, × 40; 11, oviparous female, × 7; 12, antenna of oviparous female, × 40; 13, tibia of same, × 40; 14, egg of same, × 7; 15, male, × 7; 16, antenna of same, × 40.

Lachnus tomentosus. 17, young fundatrix, × 13; 18, adult fundatrix (with cotton removed), × 8; 19, same with cottony covering on pine needle, × 4; 20, antenna of same, × 40; 21, alate viviparous with cottony covering, × 8; 21a, gonopophyses of same, × 100; 22, cornicle of apterous viviparous, × 40; 23, terminal three joints of beak of oviparous, × 40; 24, alate viviparous antenna, × 40; 25, oviparous female, × 8; 26, antenna of same, × 40; 27, hind tibia of same, × 40; 28, cauda of apterous viviparous, × 40; 29, egg, freshly laid, not yet covered with waxy secretion, × 8; 30, eggs on needle covered with waxy secretion; 31, antenna of male, × 40.

Lachnus ponderosæ Williams. 32, apterous viviparous second generation, × 8; 33, antenna of same, × 40; 34, cornicle of same, × 33; 35, terminal three joints of beak of same, × 40; 36, young of third generation, × 10; 37, alate viviparous, second generation, × 8; 38, tarsus of same, × 40; 39, gonopophyses of same, × 66; 40, cornicle of same, × 33; 41, antenna of same, × 40; 42, cauda of same, × 40; 43, tibia of oviparous, × 40; 44, antenna of male, × 40. Original; Miriam A. Palmer, Delineator.